



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 25

[Docket No.FAA-2013-0942; Notice No. 25-13-30-SC]

Special Conditions: Bombardier Aerospace Inc., Models BD-500-1A10 and BD-500-1A11 series airplanes; Autobraking System Loads.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed special conditions.

SUMMARY: This action proposes special conditions for the Bombardier Aerospace Inc. Models BD-500-1A10 and BD-500-1A11 series airplanes. These airplanes will have novel or unusual design features associated with the autobraking system for use during landing. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These proposed special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: Send your comments on or before **[insert a date 45 days after date of publication in the Federal Register]**.

ADDRESSES: Send comments identified by docket number FAA-2013-0942 using any of the following methods:

- Federal eRegulations Portal: Go to <http://www.regulations.gov/> and follow the online instructions for sending your comments electronically.

- Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, D.C., 20590-0001.
- Hand Delivery or Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, D.C., between 9 a.m. and 5 p.m., Monday through Friday, except federal holidays.
- Fax: Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to <http://www.regulations.gov/>, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov/>.

Docket: Background documents or comments received may be read at <http://www.regulations.gov/> at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, D.C., between 9 a.m. and 5 p.m., Monday through Friday, except federal holidays.

FOR FURTHER INFORMATION CONTACT: Mark Freisthler, FAA, Airframe and Cabin Safety Branch, ANM-115 Transport Airplane Directorate, Aircraft Certification Service, 1601

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SUPPLEMENTARY INFORMATION:

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data.

We will consider all comments we receive on or before the closing date for comments. We may change these special conditions based on the comments we receive.

Background

On December 10, 2009, Bombardier Inc. applied for a type certificate for their new Models BD-500-1A10 and BD-500-1A11 series airplanes (hereafter collectively referred to as “C-series”). The C-series airplanes are swept-wing monoplanes with a pressurized cabin. They share an identical supplier base and significant common design elements. The fuselage is an aluminum alloy material, blended double-bubble design, sized for nominal 5-abreast seating. Each airplane’s powerplant consists of two under wing Pratt and Whitney PW1524G ultra-high bypass, geared turbofan engines. Flight controls are fly-by-wire systems with two passive/uncoupled side sticks. Avionics include five landscape primary cockpit displays. The dimensions of the airplanes encompass a wingspan of 115 feet; a height of 37.75 feet; and a length of 114.75 feet for the Model BD-500-1A10 and 127 feet for the Model BD-500-1A11. Passenger capacity is designated as 110 for the Model BD-500-1A10 and 125 for the Model BD-500-1A11. Maximum takeoff weight is 131,000 pounds for the Model BD-500-1A10 and

144,000 pounds for the Model BD-500-1A11. Maximum takeoff thrust is 21,000 pounds for the Model BD-500-1A10 and 23,300 pounds for the Model BD-500-1A11. Range is 3,394 miles (5,463 kilometres) for both models of airplanes. Maximum operating altitude is 41,000 feet for both models of airplanes.

Type Certification Basis

Under the provisions of Title 14, Code of Federal Regulations (14 CFR) 21.17, Bombardier Inc. must show that the C-series airplanes meet the applicable provisions of part 25 as amended by Amendments 25-1 through 25-129.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 25) do not contain adequate or appropriate safety standards for the C-series airplanes because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

In addition to the applicable airworthiness regulations and special conditions, the C-series airplanes must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36, and the FAA must issue a finding of regulatory adequacy under § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The C-series airplanes will incorporate the following novel or unusual design features:

The C-series airplanes possess an autobrake system. This is a pilot-selectable function that allows earlier maximum braking at landing without pilot pedal input. When the autobrake system is armed before landing, it automatically commands maximum braking at main wheels touchdown. Normal procedures remain unchanged and call for manual braking after nose wheel touchdown.

Discussion

Section 25.493 addresses braked roll loads but does not contain a specific “pitchover” requirement addressing the loading on the nose gear, the nose gear surrounding structure, and the forward fuselage. Moreover, § 25.493 specifies airplane attitudes in accordance with figure 6 of appendix A to part 25, which are level landing attitudes. For airplanes with traditional braking systems, the current ground load requirements are considered adequate for the design of the nose gear and airframe structure. However, the C-Series airplane autobrake system, which could apply maximum braking at the main wheels with the airplane in a tail-down attitude well before the nose touches down, will cause a high nose gear sink rate and potentially higher gear and airframe loads.

Part 25 does not contain adequate requirements to address the potentially higher structural loads that could result from this type of braking system. In addition, the effects on fatigue covered by § 25.571 also need to be considered. Therefore, FAA has determined that

additional airworthiness standards are needed for the certification of this unusual design feature. These special conditions propose airworthiness standards for the certification of the C-series airplanes with an autobrake system.

Applicability

As discussed above, these special conditions are applicable to the Models BD-500-1A10 and BD-500-1A11 series airplanes. Should Bombardier Inc. apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on one series of airplanes. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701, 44702, 44704.

The Proposed Special Conditions

Accordingly, the Federal Aviation Administration (FAA) proposes the following special conditions as part of the type certification basis for Bombardier Inc. Models BD-500-1A10 and BD-500-1A11 series airplanes.

Autobraking System Loads

A landing pitchover condition must be addressed that takes into account the effect of the autobrake system. The airplane is assumed to be at the design maximum landing weight, or at the maximum weight allowed with the autobrake system on. The airplane is assumed to land in a tail-down attitude at the speeds defined by § 25.481. Following main gear contact, the airplane is assumed to rotate about the main gear wheels at the highest pitch rate generated by the autobrake system. This is considered a limit load condition from which ultimate loads must also be determined. Loads must be determined for a critical fuel and payload distribution and centers of gravity. Nose gear loads, as well as airframe loads, must be determined. The airplane must support these loads as described in § 25.305.

In addition to the above airworthiness standards, fatigue loads must also be determined and applied in accordance to § 25.571.

Issued in Renton, Washington, on November 1, 2013.

/s/

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Aircraft Certification Service

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